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INCOME TAX CAPITALIZATION IN THE  
SHARE PRICES OF SELECTED MINING STOCKS

By



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A THESIS

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## ABSTRACT

This study tests empirically for evidence of tax capitalization in the share prices of a selected sample of mining stocks as a result of the differential tax treatment accorded these stocks under the White Paper, Proposals For Tax Reform, under Tax Reform Bill C-259, and under the Income Tax Act, 1972. Of concern to this study are the tax changes that directly affect the returns to the shareholders of mining stocks. Changes occurred in the provisions relating to the taxation of capital gains, the dividend tax credit was replaced by a gross-up and credit system and the former shareholder depletion allowance was removed. Differential tax treatment of the returns to mining shares results because of the difference in the characteristics of shares within the mining sector. The extent of the inequality in tax treatment is determined by the relative size of the capital gains and dividend component in the return for each stock as well as by the size of the shareholder depletion allowance that prevailed under the former system.

The theory of tax capitalization is discussed with particular reference to stock prices. A model is developed to predict the change in value expected for each stock during three test periods, the first test period following the announcement of the White Paper, the second test period fol-







lowing the introduction of the Tax Reform Bill into Parliament and the third test period following the enactment of the new Income Tax Act. These predicted changes in value are then compared to the changes in value that actually occurred in each stock during each of the three test periods. If tax capitalization occurs then a predicted increase in the tax burden of a stock should lead to a stock price decline. Similarly a decrease in the tax burden should result in an increase in stock prices.

The empirical testing did not provide evidence to support the theory of tax capitalization in the share prices of our selected sample of mining stocks. The chi-square test for goodness of fit was applied to test the significance of the relationship between predicted and actual changes in value for each of the three test periods. Extremely high chi-square values indicated that even at the .001 level of significance there was no significant relationship between predicted and actual values. Several explanations of these findings are advanced. First of all, following the White Paper, investors may have anticipated less harsh treatment in the final legislation. Secondly, the proposed and actual tax changes only minimally affect non-residents. This coupled with the high degree of non-resident ownership in the mining industry could explain the absence of observable tax capitalization. Thirdly, investors may have anticipated full taxation of capital gains following the Carter proposals and when only



one-half of such gains became taxable this was perceived as a tax decrease. Fourthly, in anticipation of changes, investors may have made asset price adjustment during the lengthy period of tax reform debate preceeding the White Paper. Finally investors may be uncertain of the effect of the changes until they file their first tax returns under the new system. All or some of these might explain the absence of observable tax capitalization.





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# TABLE OF CONTENTS

ABSTRACT .....	i
ACKNOWLEDGEMENTS .....	iv
TABLE OF CONTENTS .....	v
LIST OF TABLES .....	vi
LIST OF FIGURES .....	vii

CHAPTER	PAGE
I INTRODUCTION .....	1
II THE TAX TREATMENT OF THE RETURN FROM COMMON STOCK ..	9
The Former Income Tax System .....	11
White Paper Proposals .....	14
The Present Income Tax System: The Income Tax Act, 1972 .....	19
III TAX CAPITALIZATION .....	24
Theoretical Tax Capitalization .....	24
The Tax Capitalization Model .....	29
IV EMPIRICAL TESTING OF THE TAX CAPITALIZATION MODEL ..	35
Selection of the Sample .....	36
Derivation of Variable Values Used in the Model ..	38
Use of the Capitalization Model .....	42
Tests on the Results .....	51
V SUMMARY & CONCLUSION .....	61
Summary .....	61
Conclusion .....	62
BIBLIOGRAPHY .....	64
APPENDIX A .....	68
APPENDIX B .....	70
APPENDIX C .....	72



## LIST OF TABLES

TABLE	PAGE
4-1 .....	37
4-2 .....	44
4-3 .....	45
4-4 .....	46





## LIST OF FIGURES

FIGURE	PAGE
4-1 .....	53
4-2 .....	54
4-3 .....	55





## CHAPTER I

INTRODUCTION

The market price of a firm's common stock is determined by the expectations of investors. Their expectations in turn are shaped by the expected future income the stock will yield. Income from a stock takes the form of dividends per share plus the difference between buying and selling price at the end of a given time period (capital gain).

Under the White Paper Proposals For Tax Reform and the subsequent Tax Reform Bill the returns to shareholders of some mining and petroleum stocks are subjected to harsher tax treatment than others. Investors who hold the securities of these firms face the prospect of their future after tax earnings declining by the amount of the additional tax burden. Since investors value a stock on the basis of its future earning potential we can expect the value (prices) of these stocks to decline. This is the phenomenon referred to as "tax capitalization."

This study attempts to test empirically for evidence of tax capitalization in the share prices of selected mining stocks. The study was undertaken primarily in response to the findings of the Cummins study<sup>1</sup> which did not

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<sup>1</sup>G. M. Cummins, "Income Tax Capitalization," unpublished Master's thesis, University of Alberta, 1971.



support the theoretical predictions. Cummins tested for tax capitalization in a selected sample of oil and gas company stocks following the announcement of the White Paper proposals and found no evidence to support the theory. This study is based on a selected sample of forty-three mining stocks and attempts as closely as possible to replicate the methodology of the Cummins study in order that the results will be directly comparable.

Tax capitalization can be expected to occur only to the extent that investors hold expectations about future tax changes. It is possible that an astute investor might have foreseen tax changes as early as 1962, when the Carter Commission was appointed, and that he made compensatory stock price adjustments prior to the announcement of the White Paper. Any attempt to measure tax capitalization prior to the White Paper, however, would be impossible because of the many extraneous factors that could affect stock prices over such a lengthy period. For this reason it was decided to begin testing for tax capitalization at the time of Finance Minister Edgar Benson's announcement on November 7, 1969 of the government's White Paper Proposals For Tax Reform. It was not until this time that the taxpayer could actually compute the amount of his future tax liability. Then on June 18, 1971 the government introduced into the House of Commons, Tax Reform Bill C-259, an Act to amend the Income Tax Act. This would be the logical second stage at which to



test for tax capitalization. Finally on January 1, 1972, following the enactment of the new Income Tax Act, the final point had been reached at which tax capitalization could be expected to occur.

At each of these points in time, the White Paper proposals of November 7, 1969, the Tax Reform Bill of June 18, 1971, and the new Income Tax Act of January 1, 1972, changes occurred in the tax position of the shareholders of mining stocks. Although changes also occurred in the treatment of mining income at the corporate level, changes that could affect the general level of mining stock prices, this study does not attempt to investigate their effects. Firstly, it would be extremely difficult to separate the tax determinants of the general stock price level of mining stocks from the multitude of non-tax determinants. Secondly, as it will be shown later, the immediate impact of adverse changes at the corporate level is somewhat lessened by the generous transitional provisions provided as well as by the several new concessions granted the extractive industries. Finally, the great degree of uncertainty in the minds of shareholders regarding the impact of tax changes at the corporate level would make it impossible to test for their effects on share prices. For these reasons tax changes at the corporate level will be ignored. We turn now to a discussion of the proposed tax changes at the shareholder level.

The two forms of income from common stocks were





treated differently under the old Act, dividends being included in income and taxed at the shareholder's marginal tax rate while capital gains were tax exempt. In the case of dividends, the shareholder's tax burden was somewhat lightened by a shareholder depletion allowance and by the dividend tax credit provision. If a dividend was received from a Canadian resource company the taxpayer was entitled to a deduction from dividend income of an amount up to 20 per cent of the dividend. The dividend tax credit allowed the taxpayer to reduce his tax payable by an amount equal to 20 per cent of dividends received from taxable Canadian corporations.

In its White Paper, Proposals for Tax Reform, released on November 7, 1969, the Federal government proposed certain changes in the tax treatment of the income from stocks in general. It proposed, furthermore, specific changes that would affect the resource industries. First of all, the White Paper distinguished between widely-held and closely-held companies. Widely-held stocks were to be those listed on a prescribed Canadian stock exchange on November 7, 1969, or those that were subsequently so listed. All other stocks were to be considered closely-held. Our discussion will center on the tax treatment of widely-held companies. Firstly, sufficient data for closely-held companies is unavailable. Secondly, closely-held companies constitute a relatively insignificant portion of the mining sector.



Thirdly, it is the shareholders of widely-held companies that would suffer the greatest discrimination under the proposals of the White Paper and the Reform Bill. For these companies one half of capital gains, which were formerly tax exempt, were to be taxed at the shareholder's marginal tax rate while one half of capital losses were to be deductible. In place of the dividend tax credit the government proposed a gross-up and credit provision which was designed to reduce the effect of double taxation of distributed corporate income. In contrast to the dividend tax credit provision under the old Act, the gross-up provision of the White Paper was to apply only if the company had actually paid tax on the dividends.

Thus it can be seen that holders of some mining stocks would be more adversely affected by the proposals of the White Paper than others. Shareholders would be required to include as income one half the gains on the sale of such stocks and would lose the shareholder depletion allowance. Thus shares with a high capital gains component would receive harsher tax treatment. Furthermore, the shareholders of stocks in companies that paid little or no corporate income tax would be more adversely affected under the proposals since they would not be eligible for a tax credit under the gross-up and credit arrangement.

On June 18, 1971, the government introduced Bill C-259 which was based on the White Paper proposals. It pro-



posed the following changes that affect the shareholders of stocks in the resource industries. To begin with the distinction between closely-held and widely-held corporations was dropped and one half the capital gains resulting from the disposition of all shares are to be taxed at the taxpayer's marginal tax rate while one half of the losses are deductible. This leaves the tax treatment of capital gains for widely-held companies essentially the same as under the White Paper. The gross-up and credit provisions proposed by the White Paper were dropped and a revised dividend tax credit system implemented. Under the new system the dividend tax credit is increased to 33 1/3 per cent but this amount is then included in income. An amount of approximately 33 1/3 per cent of the dividend<sup>2</sup> is then deducted as a tax credit from the shareholder's tax liability to arrive at income tax payable with no refund allowed. These provisions were all incorporated in the new Income Tax Act which became effective January 1, 1972.

It can thus be seen that under the provisions of the Tax Reform Bill as well, some shareholders of mining stocks would be adversely affected. First, as under the proposals of the White Paper, holders of common stocks (includ-

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<sup>2</sup>The precise amount of the tax credit depends upon the provincial income tax rate which is expressed as a percentage of the federal rate. Under a "standard" provincial tax, expressed as 30 per cent of the federal tax, the effective tax credit is 34.7 per cent.





ing mining stocks) would be required to include in their taxable income one half of capital gains realized upon the disposition (or deemed disposition) of such stock. Secondly, shareholders of mining and petroleum stocks would also lose the shareholder depletion allowance granted under the former tax system. Thirdly, the tax position of some shareholders would change as a result of the replacement of the dividend tax credit by the gross-up and credit provisions. Because the returns to individual mining stocks differ in their relative capital gains and dividend components this will result in differential tax treatment in the returns to holders of individual mining stocks. Furthermore, those shareholders who lose the depletion allowance will suffer more relative to those who had no depletion allowance to lose.

Chapter II outlines in more detail the provisions of the former Income Tax Act, the changes proposed by the White Paper, and the proposals contained within the Tax Reform Bill which were incorporated essentially unchanged into the new Income Tax Act.

Chapter III contains a discussion of the theory of tax capitalization as well as the development of the two models employed in the testing of the theory. The first model is the one employed by Cummins while the second model contains several modifications made necessary by the changes of the Tax Reform Bill.

Chapter IV employs the models to provide predictions



of expected changes in value due to tax capitalization. These expected changes resulting from the announcement of the White Paper, announcement of Bill C-259, and the enactment of the new Income Tax Act are then compared to the actual changes in value that occurred over the three test periods, November 7, 1969 to December 31, 1969; June 18, 1971 to August 4, 1971; and December 22, 1973<sup>3</sup> to January 31, 1972.

Chapter V interprets the findings and discusses the conclusions reached.

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<sup>3</sup>December 22, 1971 is Valuation Day, the day the capital gains system became effective for publicly traded shares.



## CHAPTER II

THE TAX TREATMENT OF THE RETURN FROM COMMON STOCK

Investors in equity stocks realize a return on their investment in two ways--the receipt of cash dividends and the realization of capital gains. Each of these received different treatment under the former Income Tax Act. The White Paper proposed changes in the treatment of both dividends and capital gains. It proposed to treat the returns from closely-held corporations differently than the returns from widely-held corporations. It proposed, furthermore, to remove some of the tax concessions granted the resource industries under the former Act.

The new Income Tax Act maintains the distinction between dividends and capital gains. Although the White Paper distinction between widely-held and closely-held corporations has been dropped, the tax treatment accorded widely-held corporations will remain essentially the same.

This study examines the differential tax treatment accorded mining shares possessing various characteristics, i. e. varying proportions of shareholder's return attributable to capital gains and to dividends, within the mining sector. Thus we will be concerned with only the tax changes that directly affect the shareholder's return. These changes occurred in the provisions affecting the tax treatment of capital gains, dividends and the shareholder





depletion allowance. Omitted from consideration will be the tax changes at the corporate level. These changes are expected to affect all mining companies in much the same manner and thus result in little differential tax treatment among various stocks. Furthermore, the great deal of uncertainty in the minds of shareholders regarding the impact of these changes on their returns renders any attempt to analyze them almost impossible.

This chapter examines the income tax treatment of the return to mining stocks under the former tax system and analyzes the White Paper proposals and the Tax Reform Bill provisions isolating those changes that result in discriminatory tax treatment of the return to mining stocks. Changes that affect the shareholders directly occurred in the provisions governing shareholder depletion allowances, the dividend tax credit and capital gains. To the extent that these tax changes are discriminatory it is expected that tax capitalization in the share prices of mining stocks will occur.

We now turn to a detailed discussion of the tax treatment accorded the mining industry under the three taxation systems and how the tax changes of the White Paper and the Reform Bill are expected to affect the return from mining stocks.



### The Former Income Tax System

This section of the chapter examines in detail the taxation provisions of the former Income Tax Act that govern the two elements of return to the stockholder--capital gains and dividends. In this connection an examination will be made of the tax treatment of capital gains, the dividend tax credit and the shareholder depletion allowance.

Under the Income Tax Act a distinction is made between transactions that are capital in nature and those that are defined as income. Capital gains are tax exempt whereas income is taxable. Because the Income Tax Act provides us with no definition of a capital gain the distinction between capital gains and income has been left for court interpretation. In this connection, certain rules have been established which act as guides. The major criterion in making the decision between taxable income or a non-taxable gain is whether or not the transaction was "...an adventure in the nature of a trade."<sup>1</sup> This test involves the owner's intention. Customarily the gains resulting from the acquisition or disposal of equity stocks has been treated as a capital gain and hence not subject to taxation. The former Income Tax Act, however, specifically includes cash dividends

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<sup>1</sup>Minister of National Revenue vs. Taylor (1956) 56 DTC 1131.



on equity stocks as taxable income<sup>2</sup> and specifically excludes stock dividends from its definition of taxable income.<sup>3</sup>

The cash dividends of a corporation are paid out of after-tax corporate profits. The shareholder upon receipt of such dividends must then include them in his taxable income. To the extent that the corporation is unable to shift this tax either forward to the consumers of its products or backwards to its factors of production there exists a situation of double taxation on the distributed income of the corporation. In order to partially offset this burden of double taxation and also to provide an incentive for Canadians to invest in Canadian corporations, the dividend tax credit was instituted.<sup>4</sup> An individual who was a resident in Canada at any time during the taxation year and received dividends from taxable Canadian corporations was entitled to a tax credit with respect to such dividends. Under this provision the taxpayer received a credit against his tax payable of 20 per cent of the net dividend income from a taxable Canadian corporation. Although the dividend tax credit was designed to roughly offset the corporation tax paid by taxable Canadian corporations, it does not follow that the corporation had in

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<sup>2</sup>Canada, Income Tax Act, 1952 RSC c. 148 as ammended sec. 6 (1) (a).

<sup>3</sup>Ibid, sec. 139 (1) (k).

<sup>4</sup>Ibid, sec. 38.





fact paid tax, or enough of it to cover dividends. Furthermore because dividend tax credit refunds were not allowed, this provision offered no tax relief to shareholders whose incomes fell below the exemption level.

Affecting the return to shareholders is the shareholder depletion allowance that the former Income Tax Act allowed. Depletion allowances are deductible allowances in respect of the depletion or exhaustion of natural resources such as oil, minerals and timber limits. The rationale for such an allowance lies in the recognition that each year's production of a mineral or oil well decreases the natural resource that is being exploited and that some account must be taken of this decrease, or depletion, in order to obtain the true profit of the operation. Part of the proceeds of the sale of the mineral represent a return of the capital investment in the resource. Because many of the expenses of acquiring and developing mineral rights have since become deductible for tax purposes, these depletion allowances served more as an incentive to induce taxpayers to undertake more exploration and development than they otherwise would.<sup>5</sup> In addition to the dividend tax credit discussed earlier, stockholders of certain dividend paying resource companies were entitled to a shareholder depletion allowance<sup>6</sup> on the

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<sup>5</sup>Canada, Proposals for Tax Reform, par. 5.37.

<sup>6</sup>Canada, Income Tax Act, sec. II (2).



dividend. This provision differs from the dividend tax credit in that it was deducted from the dividend in the calculation of taxable income, whereas the dividend tax credit was deducted from the actual tax payable. Under the former Income Tax Act, a percentage depletion allowance could be deducted from dividends received from mining and oil companies. Deductions of 10%, 15%, or 20% were available, the percentage depending upon the proportion of the income of the corporation that was derived from mineral production.<sup>7</sup>

#### White Paper Proposals

In its White Paper, Proposals For Tax Reform, the government proposed various changes from the then existing treatment of the return from equity stocks. These changes discriminate against common stocks generally and result in differential tax treatment of stocks within the mining sector. A major change was the distinction the White Paper made between closely-held and widely-held corporations. This distinction was intended to reflect the differences in the relationships between corporations and their shareholders as well as the difference in each type's competitive environment.<sup>8</sup> The objective of the proposed distinction was to put

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<sup>7</sup>Canada, Statutory Orders and Regulations, (Ottawa: Queen's Printer, 1955 Consolidation), p. 1903.

<sup>8</sup>Canada, Proposals for Tax Reform, par. 4.19



each type of corporation as nearly as possible in the same tax position as its competitors.<sup>9</sup> The White Paper put forth several rules which would distinguish a widely-held corporation from a closely-held one. The major distinction was that widely-held Canadian corporations were deemed to be those whose shares were listed on a prescribed Canadian stock exchange on November 7, 1969, or those whose shares subsequently became so listed.<sup>10</sup> In practice this would also include most corporations whose shares were traded "over the counter." All other corporations would be classified as closely-held.

The returns to the shareholders of each of these types of corporations would be treated differently for tax purposes. Stockholders of closely-held corporations could elect the partnership option<sup>11</sup> and as such they would be taxed as if the corporation's earnings were theirs. If the partnership option were not chosen, the corporation would be taxed at the proposed 50% corporate tax rate applicable to all widely-held corporations. If, however, a distribution was made to the shareholders within two and one-half years, they would receive credit for the full tax paid by the cor-

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<sup>9</sup> Ibid, par. 4.20.

<sup>10</sup> Ibid, par. 4.43.

<sup>11</sup> Ibid, par. 4.21.



poration on the distributed profits.<sup>12</sup> These proposals for integrating the personal and corporate tax were designed to offer a better method of avoiding double taxation of distributed corporate profits. This will be discussed later in this section. For reasons previously outlined our discussion will center primarily on those provisions directly affecting the return to the shareholders of widely-held mining stocks. Each provision will be examined to determine its expected differential impact on the return to holders of mining stocks. We will examine in turn the provisions governing the inclusion of capital gains into taxable income, the new gross-up and credit provision and the shareholder depletion allowance.

In order to make Canada's tax system more "fair and effective," the government proposed that capital gains be taxed when they were realized or deemed to be realized. All or part of the capital gain would be treated as ordinary income, depending upon the type of asset involved. Generally capital gains would be fully taxed at the taxpayer's marginal tax rate and capital losses fully deductible from taxable income. Here again a distinction was made between closely-held and widely-held corporations. Gains on the sale of shares of closely-held private corporations were to be fully taxed and losses on the sale of such shares were to be

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<sup>12</sup>Ibid, par. 4.24





fully deductible.<sup>13</sup> Stockholders of widely-held corporations would include only one-half of their gains on the sale of these shares in taxable income and deduct only one-half of their losses. Because of the variation in the capital gains component in the return from various mining stocks this provision would more adversely affect the return from some stocks than others. The White Paper proposed, furthermore, a revaluation of these shares to market value every five years with one-half the resulting gain or loss to be taken into account for tax purposes in that year.<sup>14</sup> Situations could arise where a shareholder with a high capital gains return would be forced to liquidate a substantial portion of his common stock portfolio in order to meet his tax liability on the accrued capital gains. Income averaging provisions<sup>15</sup> were proposed which were designed to alleviate somewhat the harsh tax effects on windfall gains.

The proposed gross-up and credit provisions<sup>16</sup> were to replace the dividend tax credit as a method of avoiding double taxation. This provision took into account the taxes already paid by a corporation on its distributed income. Under the White Paper proposals a Canadian shareholder would

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<sup>13</sup>Ibid, par. 3.31.

<sup>14</sup>Ibid, par. 3.33.

<sup>15</sup>Ibid, par. 2.56.

<sup>16</sup>Ibid, par. 4.36.



receive credit for one-half the Canadian corporation tax paid by the corporation on the profits from which the dividend was paid.<sup>17</sup> The system would work as follows: Upon receipt of a dividend the stockholder would add (or gross-up) to this dividend, 50 per cent of the tax paid by the company on the profits from which the dividend was paid. He then would be taxed at his marginal rate on this grossed up amount and then permitted to deduct the amount of the gross-up (or tax paid by the corporation) from his tax payable. In the event that the allowable deduction (gross-up) was greater than his tax payable the shareholder would receive a refund of the excess. This procedure applied to both cash and stock dividends.<sup>18</sup> Furthermore, this credit would only be given if the dividend was paid within the two and one-half year time limit.<sup>19</sup> It should be noted that this integrated tax credit depends upon the extent to which the corporation has paid taxes on the underlying cash flow. Because the taxable income of mining companies is reduced by incentives like depletion allowances and rapid capital cost write-offs, these companies would lose some of the differential advantages which they enjoyed under the old

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<sup>17</sup>Ibid, par. 4.36

<sup>18</sup>Ibid, par. 4.37

<sup>19</sup>Ibid, par. 4.36



dividend credit system.<sup>20</sup>

Shareholders of resource company stocks would under the White Paper proposals also lose shareholder depletion allowances.<sup>21</sup> The government felt that new provision for deduction of losses realized on shares held would better achieve the objectives of the shareholder depletion allowance. This would obviously lower the return to the shareholders of those mining stocks that would lose their deduction.

The Present Income Tax System: The Income Tax Act, 1972

On June 18, 1971, following nearly two years of public discussion on the tax reform proposals of the White Paper, the government introduced in the House of Commons, Bill C-259, an Act to amend the Income Tax Act.

The proposals of the Tax Reform Bill, now embodied basically unchanged in the new Income Tax Act, contained changes in the provisions relating to capital gains, dividend tax credit and shareholder depletion allowances. This final section of the chapter will examine each of these changes indicating which changes have a differential effect upon the return to mining shares.

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<sup>20</sup>M. Bucovetsky, and R. Bird, "Tax Reform in Canada: A Progress Report," National Tax Journal, vol. XXV, (March, 1972) p. 30 - 31.

<sup>21</sup>White Paper, par. 5.44.





Under the new tax legislation, capital gains (including gains on the sale of equity shares) will for the first time be included in the definition of taxable income. Generally one half of such gains are "taxable capital gains" and must be included in the taxpayer's income and taxed at the marginal personal rate in the case of an individual and at the corporate tax rate in the case of a corporation. With a few minor exceptions one half of capital losses will be deductible against capital gains with indefinite loss carry forward provisions and a one year loss carry back. This provision coupled with the automatic general averaging provision<sup>22</sup> and the forward averaging income annuities provision<sup>23</sup> should help reduce somewhat the harsh effects the progressive rate structure would have upon unusually large gains realized in any one particular year. For widely-held companies, the ones under consideration in this study, the new capital gains tax is essentially the same as the one proposed in the White Paper. Despite the more liberal averaging provisions the capital gains tax provision will discriminate against the holders of some mining shares due to the relatively large capital gains component in their return.

The new Act contains no general periodic revaluation

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<sup>22</sup>Canada, Income Tax Act, sec. 118.

<sup>23</sup>Ibid, sec. 118.



provisions as proposed by the White Paper.<sup>24</sup> Gains will be taxable and losses deductible when assets are sold or given away, upon cessation of Canadian residence, upon death, or as a result of changes in the use of an asset. Individual taxpayers may elect one of two methods for determining the base value of assets held prior to the start of the new system (January 1, 1972), with reference to which future gains and losses will be defined. The election must be made the first time a taxpayer reports gains or losses and becomes binding on him for all subsequent asset dispositions. The taxpayer may choose as a base value for determining gains and losses either fair market value on Valuation Day or the "tax-free zone" method under which gains are based on the greater of historical cost or Valuation Day value; losses are based on the lesser of original cost or Valuation Day value.<sup>25</sup> Corporations must employ the "tax-free zone" method. For publicly-traded securities Valuation Day was December 22, 1971 and for all other assets Valuation Day was December 31, 1972.

A revised system of gross-up and credit will replace

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<sup>24</sup>The exception is property held in trusts in which case unrealized capital gains and losses on property are deemed to be realized periodically and at least every twenty-one years.

<sup>25</sup>CCH editors, Analysis of the Canadian Tax Reform Bill, 1971, (Ottawa: Commerce Clearing House, 1971), par. 311.



the old dividend tax credit provision as a rough means of achieving partial integration of individual and corporate taxes. Under the new system the shareholder grosses up his taxable dividends by 1/3 of the dividends received and is then allowed an amount of approximately 1/3 of these dividends (the precise amount depending upon the tax rate levied by the provinces) as a credit against his tax payable.<sup>26</sup> This applies to all dividends received from taxable Canadian corporations regardless of corporate taxes paid. In no event will the credit result in a refund of tax to the shareholder. Replacement of the dividend tax credit provision by the gross-up and credit provision does not appear to have any discriminatory effect on the holders of mining stocks. Although shareholders with marginal tax rates in excess of 40% (taxable income over \$14,000) will pay more taxes under the new system, this is largely offset by the provision allowing the credit to be calculated on gross dividends (dividends plus interest and carrying charges) which is of more benefit to high marginal taxpayers.<sup>27</sup>

The shareholder depletion allowance of up to 20% of gross dividends from resource companies is discontinued effective January 1, 1972. It is felt that the objectives

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<sup>26</sup>Canada, Income Tax Act, sec. 82 (1) and sec. 121.

<sup>27</sup>R. J. Dart, Proceedings of the Twenty-Third Tax Conference, (Toronto: Canadian Tax Foundation), p. 113.



of the old provision could better be achieved by the deduction granted for one-half of capital losses. This removal of shareholder depletion would result in a lower return to the holders of mining stocks relative to the holders of other stocks. Those shareholders who lose this concession would suffer more than those who had never received the allowance under the old system.

It can thus be seen that under the new tax legislation the shareholder's return from equity shares in some mining stocks will be more adversely affected than the return from equity shares in other mining stocks. This is brought about by the removal of shareholder depletion allowances, replacement of the dividend tax credit by the gross-up provision, and the capital gains tax provision. Depending upon the relative size of the capital gains component and the dividend component in the return to each individual stock, there will be a differential tax effect.

In the instances where tax changes would reduce the return from mining stocks it is expected that a decrease in the stock prices would result if the rates of return to shareholders are to be maintained. Conversely where these changes result in an increase in the return to mining stocks, an increase in stock prices would be expected. A further discussion of the possible and probable expected changes will be the subject of the next chapter.





## CHAPTER III

TAX CAPITALIZATIONTheoretical Tax Capitalization

The differential tax burden placed on the returns to the shareholders of some mining stocks will result in a decrease in return to those stocks. The theory of tax capitalization would lead us to expect a decrease in the prices of those shares that will be subjected to harsher tax treatment relative to the others. Assuming that investors are aware of the impact these tax increases will have on their returns we would expect one of two possible results, either tax capitalization or tax diffusion. This chapter discusses these two possible effects and draws the conclusion that in theory tax capitalization is the more probable result. The proposed tax changes are then examined to determine whether they meet the requirements necessary for tax capitalization to occur.

When a differential tax is levied on one segment of industry, in our case the resource industry, investors in mining stock can be expected to shift their funds from the less attractive mining stocks into those mining stocks (or other investments) where monetary rewards have not been lowered by increased taxation. Depending upon the relative size of the sector discriminated against, this process will



result in either diffusion of the tax over all the financial investments or the capitalization of the tax burden. Tax capitalization is the process whereby a decrease or increase in taxes on an asset or the income derived from the asset results in a change in value of the asset. If tax capitalization occurs, the value of the asset will decrease with a tax increase, all other things remaining unchanged. Similarly, a decrease in taxes will lead to an increase in the value of the asset. Tax diffusion on the other hand is the process whereby a decrease or increase in taxes on an asset results in a change in the rate of return, with the value of the asset remaining relatively unchanged. A tax increase will in this case lead to a decrease in the rate of return and conversely a tax decrease will result in an increase in the rate of return. These two phenomena can best be explained by way of a hypothetical example.<sup>1</sup>

Assume an economy in which only two types of investments, stocks and bonds, compete for the investor's capital. Let each instrument have a value of \$100, be of equal risk and yield a return of \$5. Suppose a discriminatory tax of 20 per cent is levied on the return from the stock held by the investor. This reduces the return on the stock to \$4 while the return from the bond remains at \$5. Let us assume

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<sup>1</sup>E. R. Rolfph and G. F. Break, Public Finance, (New York: The Ronald Press, 1961), p. 214.



further that the market discount rate which represents the rate of return on the next best alternative investment (the bond in this case) is 5 per cent. We will now consider the effect on the price of the stock where the taxed stock composes varying portions of the total market available to the investor.

In the case where the taxed stock represents only a relatively small proportion of the total market we would expect investors to respond to a discriminatory tax by shifting their funds from the stock segment which yields only 4 per cent to the bond segment which still yields 5 per cent. This shift would bring about a decline in the stock prices until the return on the stock is once again equal to that of the bond (i.e. 5 per cent). The expected stock price decrease would equal the discounted present value of all future tax outflows. In our example (assuming a constant tax increase per time period) this would amount to  $(\$1 \div 0.05)$  or \$20. Thus the imposition of the tax would bring about a decline in the price of the stock to \$80 ( $\$100 - \$20$ ) when it will yield a return of \$4. At this point the rate of return on the stock would once again be 5 per cent, the same rate as the return on bonds. In this example the tax has been fully capitalized.

Now let us assume that the taxed stock represents a relatively large portion of the total market for investor's funds. In this case it would be virtually impossible for





investors to shift their funds into bonds, as there would simply not be sufficient bonds to match the amount stockholders would be willing to divert into bond investments. The probable result would rather be a decline in the market discount rate to approximately 4 per cent as the prices of bonds are rapidly bid up. No change occurs in the prices of stocks but the rate of return has been lowered to 4 per cent for all investments of comparable risks. Thus the tax change is not capitalized but is rather diffused over the entire investment market. Before a tax can be capitalized certain conditions must be met. Buehler<sup>2</sup> describes these as follows:

(1) The taxed object must be an income-yielding object providing a monetary or other valuable income (e.g. bond or securities). There must be some measurable value in which the tax can be reflected. (2) The taxed object must have a relatively long life and must have a relatively inelastic supply. If this were not the case the taxed object could disappear from the market in response to an imposed tax or if the supply were elastic the tax would simply be reflected in an adjustment of supply without an observable tax impact. (3) There must be some inequality in taxation, i.e. there must be some tax differential to be capitalized. A non-discriminatory, uniform tax, although it would have economic

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<sup>2</sup>A. G. Buehler, "The Capitalization of Taxes," National Tax Journal, vol. III (December, 1950), pp. 284-288.



repercussions, would not be capitalized by making adjustments in the present values of future income streams. (4) There must be some degree of certainty about the amount of the tax liability. This is necessary in order for the investor to measure the amount of his changed tax position.

The proposed differential tax treatment accorded the shareholders of mining stocks under both the White Paper and the Tax Reform Bill seems to satisfy these four conditions. To begin with, mining stocks are income-yielding objects providing a monetary income in the form of dividends and capital gains. Furthermore, in the case of public companies their value can be readily measured in the quoted prices of their stock. The first condition is clearly satisfied. Historically stocks of public companies have been observed to have relatively long life spans and a relatively inelastic supply.<sup>3</sup> These stocks cannot be readily created or wiped out in a short period of time. This satisfies the second condition. As outlined in the previous chapter, the stocks of widely-held mining companies were selected for this study because of the differential tax treatment accorded them under both the White Paper and the Tax Reform Bill. The extent of the differential tax treatment of individual stocks is determined by the relative size of the capital gains and dividend components of the return to each stock as well as by

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<sup>3</sup>Cummins p. 20.



the shareholder depletion rate applicable to each stock. Not only will some mining stocks be discriminated against in the stock sector of the investment field, but stocks in general compete with other forms of investments (bonds, mortgages, etc.). Thus the third condition is satisfied. Because the taxpayer can calculate the amount of his future tax burden under the White Paper and under the Reform Bill provisions, the fourth and final condition appears to be satisfied. Although the taxpayer could calculate his actual tax liability under both the White Paper and Reform Bill proposals it is not altogether certain that he would make asset price adjustments at either of these times. Perhaps we should not expect any capitalization to occur prior to enactment of actual legislation. It may also be that investors are unaware of the actual tax implications of the new legislation and will wait until it is time to file their first tax return under the new system before making any tax calculations and subsequent asset price adjustments.

#### The Tax Capitalization Model

According to the theory of tax capitalization a tax increase on stocks should, ceteris paribus, result in a stock price decrease. Similarly a tax decrease should result in a stock price increase. Since this study tests for tax capitalization at three points in time and under two different tax systems, two slightly different models will be



employed. To test for tax capitalization in mining stocks as a result of the White Paper Proposals the following model will be used:

$V$  = capitalized value of a stock (former tax system)

$V_t$  = capitalized value of a stock (White Paper)

$D_j$  = dividends provided by a stock in year  $j$

$C_j$  = Capital gain or loss provided by a stock in year  $j$  (equals the price in year  $j$  minus the price in  $j-1$ )

$Y_j$  = shareholder depletion allowance (former tax system)

$X$  = dividend tax credit (former tax system)

$Z_j$  = gross-up (White Paper)

$R$  = stockholder's marginal rate of taxation

$i$  = opportunity rate of return on the next best alternative investment.

$\Delta V$  = expected change in value of a stock

$$(a) \quad V = \frac{D_1 - [(D_1 - Y_1 D_1)(R - X)] + C_1}{1+i} + \frac{D_2 - [(D_2 - Y_2 D_2)(R - X)] + C_2}{(1+i)^2} \dots$$

$$+ \frac{D_n - [(D_n - Y_n D_n)(R - X)] + C_n}{(1+i)^n} = \sum_{j=1}^n \frac{D_j - [(D_j - Y_j D_j)(R - X)] + C_j}{(1+i)^j}$$

$$(b) \quad V_t = \frac{D_1 - R(D_1 + Z_1) + Z_1 + C_1 - R(.5C_1)}{1+i} \dots$$

$$+ \frac{D_2 - R(D_2 + Z_2) + Z_2 + C_2 - R(.5C_2)}{(1+i)^2} \dots$$





$$+ \frac{D_n - R(D_n + Z_n) + Z_n + C_n - R(.5C_n)}{(1+i)^n} \dots$$

$$= \sum_{j=1}^n \frac{D_j - R(D_j + Z_j) + Z_j + C_j - R(.5C_j)}{(1+i)^j}$$

$$\begin{aligned} \Delta V = V - V_t &= \frac{\sum_{j=1}^n D_j - [(D_j - Y_j D_j)(R-X)] + C_j - \sum_{j=1}^n D_j - R(D_j + Z_j) + Z_j + C_j - R(.5C_j)}{\sum_{j=1}^n (1+i)^j} \\ &= \sum_{j=1}^n \frac{(D_j - Y_j D_j)(R-X) - [R(D_j + Z_j + .5C_j) - Z_j]}{(1+i)^j} = \sum_{j=1}^n \frac{T}{(1+i)^j} \end{aligned}$$

$V$  represents the value of the stock under the old tax system,  $V_t$  represents the value of the stock under White Paper treatment, and  $\Delta V$  represents the capitalized value of the expected change in the tax ( $\Delta T$ ) on the return from the stock. In the above model the capitalized value of the expected future tax change allows for variation in the annual tax change. For our purposes it seems reasonable to assume that the tax changes will be constant from year to year and that the stream of taxes will be infinite, thus  $\Delta V$  can be represented by  $\Delta V = \frac{\Delta T}{i}$

To test for tax capitalization in mining stocks as a result of the Tax Reform proposals the Cummins model was slightly modified. The only change in the model comes about



as a result of the new gross-up and credit provision as discussed in the previous chapter. The following revised model will be used to test for tax capitalization in mining stocks as a result of the Tax Reform Bill and the subsequent legislation:

$V$  = capitalized value of a stock (former tax system)

$V_t$  = capitalized value of a stock (new tax system)

$D_j$  = dividends provided by a stock in year  $j$

$C_j$  = capital gain or loss provided by a stock in year  $j$  (equals the price in year  $j$  minus the price in  $j-1$ )

$Y_j$  = shareholder depletion allowance (former tax system)

$R$  = stockholder's marginal rate of taxation

$i$  = opportunity rate of return on the next best alternative investment

$\Delta V$  = expected change in value of a stock

$$(a) \quad V = \frac{D_1 - [(D_1 - Y_1 D_1)(R - X)] + C_1}{1+i} + \frac{D_2 - [(D_2 - Y_2 D_2)(R - X)] + C_2}{(1+i)^2} \dots$$

$$+ \frac{D_n - [(D_n - Y_n D_n)(R - X)] + C_n}{(1+i)^n} = \sum_{j=1}^n \frac{D_j - [(D_j - Y_j D_j)(R - X)] + C_j}{(1+i)^j}$$

$$(b) \quad V_t = \frac{D_1 - R(D_1 + D_1) + D_1 + C_1 - R(.5C_1)}{1+i} \dots$$

$$+ \frac{D_2 - R(D_2 + D_2) + D_2 + C_2 - R(.5C_2)}{(1+i)^2} \dots$$



$$+ \frac{D_n - R(D_n + \frac{D_n}{3}) + D_n + C_n - R(.5C_n)}{(1+i)^n} \dots$$

$$= \sum_{j=1}^n \frac{D_j - R(D_j + \frac{D_j}{3}) + D_j + C_j - R(.5C_j)}{(1+i)^j}$$

$$(c) \quad \Delta V = V - V_t = \frac{\sum_{j=1}^n D_j - [(D_j - Y_j D_j)(R-X)] + C_j - \sum_{j=1}^n \frac{D_j - R(D_j + \frac{D_j}{3}) + D_j + C_j - R(.5C_j)}{(1+i)^j}}{\sum_{j=1}^n (1+i)^j}$$

$$= \sum_{j=1}^n \frac{(D_j - Y_j D_j)(R-X) - [R(D_j + \frac{D_j}{3} + .5C_j) - D_j]}{(1+i)^j} = \sum_{j=1}^n \frac{T}{(1+i)^j}$$

$V$  represents the value of the stock under the former tax system,  $V_t$  represents the value of the stock under the Tax Reform Bill proposals and the subsequent Income Tax Act, and  $\Delta V$  represents the capitalized value of the expected change in the tax ( $\Delta T$ ) on the stock's return. Again as in the previous model the capitalized value of the expected future tax change allows for variation in the annual tax change. We will assume as did Cummins that the tax changes will be constant from year to year and that the stream of taxes will be infinite. Thus we can represent  $\Delta V$  by  $\Delta V = \frac{\Delta T}{i}$ .

Both of these models exclude from consideration those proposed tax changes that would affect the corporate earnings of mining companies and deal only with the proposed



changes as they would directly affect the return to the shareholder on these stocks. It is expected that changes at the corporate level will affect all mining companies in a similar manner and hence will have no discriminating effects within the mining sector. The two models developed in this chapter will be employed in the following chapter to test empirically for evidence of tax capitalization in the prices of a selected sample of mining stocks.





## CHAPTER IV

## EMPIRICAL TESTING OF THE TAX CAPITALIZATION MODEL

This chapter discusses the empirical testing for evidence of tax capitalization in the share prices of a selected sample of mining stocks. The two models developed in the preceeding chapter will be employed.

$$(a) \quad V = \sum_{j=1}^n \frac{(D_j - Y_j D_j) (R - X) - [R(D_j + Z_j + .5C_j) - Z_j]}{(1+i)^j} \quad (\text{White Paper})$$

$$(b) \quad V = \sum_{j=1}^n \frac{(D_j - Y_j D_j) (R - X) - [R(\frac{D_j + D_j}{3} + .5C_j) - \frac{D_j}{3}]}{(1+i)^j} \quad (\text{Reform Bill})$$

The first model (White Paper model) will be used to test for tax capitalization during the first test period, November 7, 1969 to December 31, 1969. The second model (Reform Bill model) will be used to test for tax capitalization during the second test period, June 18, 1971 to August 4, 1971 and also during the third test period, December 22, 1971 to January 31, 1972.

The first section of the chapter discusses the selection of the sample. Section two discusses the derivation of the values of the variables used in the models. The third section discusses how the models are employed to provide predictions of the expected change in value of each



stock. The final section compares these predicted changes with the actual changes in value that occurred during the three test periods and includes a discussion of the tests performed on the results. Some possible reasons are advanced to explain why tax capitalization did not occur.

### Selection of the Sample

Table 4-1 lists the forty-three mining stocks that constitute the sample for this study. The sample was chosen from the 297 mining stocks listed on the Toronto Stock Exchange on November 7, 1969. The final sample size of forty-three was arrived at by eliminating those stocks for which historical data on prices, earnings and dividends were unavailable for the entire period 1958 to 1969.<sup>1</sup> Mergers and amalgamations between 1968 and 1972 accounted for the further elimination of several stocks.

Data on stock earnings and dividends for the forty-three stocks during the eleven year period were gathered from the Financial Post Survey of Mines. For reasons of comparability the data were adjusted to a base year, 1958. It was assumed that in 1958 an investor held \$100 worth of a stock at its average yearly high-low price. For example, if for the year 1958 the yearly high of a particular stock was \$12

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<sup>1</sup>This period was chosen to correspond with the period chosen in the Cummins study.



TABLE 4-1

## MINING STOCKS COMPRISING THE SAMPLE

Agnico Mines Ltd.  
Asbestos Corporation Ltd.  
Aunor Gold Mines Ltd.  
Bralorne Can-Fer Mines Ltd.  
Campbell Chibougamau Mines Ltd.  
Campbell Red Lake Mines Ltd.  
Cassiar Asbestos Corporation Ltd.  
Cochenour Willans Gold Mines Ltd.  
Conwest Exploration Co. Ltd.  
Denison Mines Ltd.  
Dickenson Mines Ltd.  
Discovery Mines Ltd.  
Dome Mines  
East Malartic Mines Ltd.  
Falconbridge Nickel Mines Ltd.  
Giant Yellowknife Mines Ltd.  
Gunnar Mining Ltd.  
Hallnor Mines Ltd.  
Hollinger Remove Gold Mines Ltd.  
Hudson Bay Mining & Smelting Co. Ltd.  
International Nickel Co. Of Canada (The)  
Kerr-Addison Mines Ltd.  
Labrador Mining & Exploration Co. Ltd.  
Lake Shore Mines Ltd.  
Little Long Lac Gold Mines Ltd. (The)  
Madsen Red Lake Gold Mines Ltd.  
Manitou-Barvue Mines Ltd.  
McIntyre Porcupine Mines Ltd.  
New Calumet Mines Ltd.  
Pamour Porcupine Mines Ltd.  
Preston Mines Ltd.  
Reeves Macdonald Mines  
Sheritt Gordon Mines Ltd.  
Sigma Mines (Quebec) Ltd.  
Siscoe Mines Ltd.  
Steep Rock Iron Mines Ltd.  
Teck Corp. Ltd.  
United Keno Hill Mines Ltd.  
Upper Canada Mines Ltd.  
Willroy Mines Ltd.  
Wright-Hargreaves Mines Ltd.  
Yellowknife Bear Mines Ltd.  
Yukon Consolidated Gold Corporation Ltd. (The)



and the yearly low was \$8, the average high-low price for 1958 would be \$10. Thus an investor would be assumed to hold 10 shares ( $\$100 \div \$10$ ) of this stock. For this stock suppose that pre-tax earnings per share were \$1.50, that after-tax earnings per share were \$1 and that dividends per share were \$.50. Thus pre-tax earnings would be \$15, after-tax earnings would be \$10 and dividends would be \$5 on this investor's \$100 worth of the stock.

#### Derivation of Variable Values Used in the Model

As mentioned previously the two models employed in this study are based on the one developed by Cummins. In our models, historical data on capital gains, earnings and dividends are used to provide estimates of future values of these variables. These predicted values are then used in the models to calculate the expected change in value of each stock.

Our models require predicted values for D (dividends), C (capital gains or loss), Y (shareholder depletion allowance), R (shareholder's marginal tax rate), X (dividend tax credit), and i (rate of return on the next best alternative investment). Also required are intermediate variables  $E_1$  (pre-tax earnings) and E (after tax earnings) which are used in the calculation of Z (gross-up). The predicted values of each of these variables is presented in Appendix A. Since values for (X), (R), and (i) are identi-





cal for all stocks they do not appear in the appendix. We turn now to a discussion of the derivation of the values for each of the variables employed in the models.

Future dividends (D), future capital gains (C), future pre-tax earnings ( $E_1$ ), and future after tax earnings (E) were all estimated by calculating the arithmetic mean of these variables for the five year period 1964-1968. Initially an attempt was made to predict the future values of these variables by estimating regression equations employing time series data for the eleven year period 1958-1968, but this procedure was abandoned in favour of the averaging procedure. Since regression analysis yielded such poor results the less-sophisticated averaging procedure appeared to be the only feasible method of predicting these variables. A full discussion of the regression procedure is contained in Appendix B. Appendix C contains the results of the regression analysis. We turn now to a discussion of the computation of future available gross-up (Z).<sup>2</sup>

The amount of available gross-up (Z) depends upon two factors--the amount of dividends paid and the actual taxes paid by the mining company. For our study we will assume as did Cummins that dividends will only be paid in the future by those companies which currently have a dividend payout. Although non-dividend paying companies could at any

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<sup>2</sup>The discussion of gross-up (Z) applies only to the White Paper model.



time in the future begin to pay dividends, we have no historical data upon which to base our predictions. We will further assume that the current tax liability of a dividend paying company provides a reasonable estimate of future tax payments.<sup>3</sup> Although there are several proposed tax changes that will affect the corporate tax burden, none of these are expected to have an immediate impact (see discussion in Chapter III).

Under the White Paper proposals, the gross-up provision permits the shareholder to gross up his dividends received by an amount equal to one-half the tax paid by the company to a maximum 50 per cent of the dividend payment ( $0.5 \times D$ ). Thus gross-up ( $Z$ ) would be calculated as follows:<sup>4</sup>

$$Z = \text{the lesser of } \frac{(E_1 - E)}{2} \text{ and } 0.5 \times D$$

( $E_1 - E$ ) is by definition the amount of the future expected tax payments.

As discussed in Chapter II, the former tax system permitted shareholders of mining stocks to deduct a depletion allowance on the dividends from certain companies. Because the after-tax rate of return would be affected by the depletion allowance we require a rate, ( $Y$ ) for use in the White Paper model. These depletion rates were found to be quite

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<sup>3</sup>Cummins, p. 38.

<sup>4</sup>Ibid., p. 39.



consistent over the years. Therefore, we can assume that investors would expect the existing rate of depletion to prevail in the future. Furthermore, because the rate payable in 1969 is based on the "mineral profits" earned in 1968, the taxpayer can actually calculate the rate applicable in 1969 prior to White Paper Day and this is the rate they would be led to expect in the future. Appendix A lists the 1969 shareholder depletion rates on dividend paying stocks, which are also our predicted shareholder depletion rates, (Y).

A marginal tax rate (R) of 50 per cent was chosen for this study for the reasons discussed in Cummins.<sup>5</sup> Briefly, this rate was chosen for three reasons: (1) because various studies have shown that the mean rate is in this area; (2) companies can be stockholders, and the corporate rate is approximately 50 per cent; and (3) it is at this rate that under the White Paper proposals and the Tax Reform Bill provisions the stockholder would be indifferent as to the form in which he received his return--capital gains or dividends.

A rate of return (i) of 15 per cent was chosen as the rate of return on the next best alternative investment. Since investors in mining stocks have as their next best alternative the option of investing in other common stocks, an appropriate rate would seem to be the historical rate of return on common stocks in general. Although no comprehensive

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<sup>5</sup>Ibid. pp. 43-44.



Canadian study is available on such a rate, Fisher and Lorie<sup>6</sup> in their analysis of stocks on the New York Stock Exchange for the period 1926 to 1960 arrived at a rate of 15 per cent for the latest 10 year period, 1950 to 1960.<sup>7</sup>

### Use of the Capitalization Model

In order to provide a basis of comparison between and among various stocks in the sample and between various years, the average yearly high-low price per share, earnings per share and dividends per share were all brought to the base 100 in 1958. Thus an investor is assumed to hold \$100 of a stock at its yearly average high-low price in 1958. For example, the shares of Aunor Gold Mines traded at a 1958 high-low of 2.84 and 1.93 for a yearly average of 2.38  $[(2.84 + 1.93) \div 2]$ . After tax earnings per share were 0.19 and dividends per share were 0.16. Thus an investor was assumed to hold 42.02  $(\$100 \div 2.38)$  shares, or \$100 worth of this stock with after tax earnings per share of 7.98  $(42.02 \times 0.19)$  and dividends per share of 6.72  $(42.02 \times 0.16)$  for this \$100 worth. The predicted values for capital gains (C), pre-tax earnings ( $E_1$ ), after-tax earnings (E), and dividends (D) in Appendix A reflect that the investor held \$100 worth

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<sup>6</sup>L. Fisher and L. H. Lorie, "Rates of Return on Investments in Common Stocks," Journal of Business, vol. 38 (January, 1964) p. 1.

<sup>7</sup>Ibid. p. 5.





of a stock in 1958 and held those shares until 1968. In the case of Aunor Gold Mines the investor would be assumed to hold 42.02 shares of this stock for the duration of the 1958-1968 period.

Tables 4-2, 4-3 and 4-4 present the predicted changes in value for each stock as well as the actual changes in value that occurred during each of the three test periods. Table 4-2 deals with the first test period November 7, 1969 to December 31, 1969, and shows both the predicted and actual changes in value for each stock following the announcement on November 7 of the White Paper on tax reform. Table 4-3 deals with the second test period, June 18, 1971 to August 4, 1971, and shows both the predicted and actual changes in value for each stock following the June 18 publication of the Tax Reform Bill. Finally Table 4-4 deals with the third test period December 22, 1971 (Valuation Day) to January 31, 1972 when tax reform legislation affecting common shares became effective. These three test periods will subsequently be referred to as test period one, test period two and test period three respectively. We will discuss in turn the computation of both predicted changes in value and actual changes in value for each of the three test periods.

The figures in the predicted change in value columns of Tables 4-2, 4-3 and 4-4 reflect the change in value expected for \$100 worth of a particular stock held in 1958. For example, the predicted change in value for Aunor Gold



EXPECTED AND ACTUAL CHANGES IN VALUE OF \$100 WORTH OF EACH  
STOCK HELD FROM NOVEMBER 7, 1969 TO DECEMBER 31, 1969.

Stock	Changes in Value (ΔV)	
	Expected	Actual
Yellowknife Bear Mines	-216.38	-168.08
Denison Mines	-170.06	-44.39
Manitou-Barvue Mines .	-159.26	-50.00
Siscoe Mines	-133.37	-74.63
Pamour Porcupine Mines	-123.76	-40.32
Dome Mines	-89.20	+2.45
Agnico Mines	-84.62	-46.15
Preston Mines	-76.72	-47.61
Campbell Red Lake Mines	-74.61	-27.20
Yukon Consolidated Gold Mines	-74.58	+77.97
Falconbridge Nickel Mines	-69.58	+86.25
McIntyre Porcupine Mines	-59.95	+52.08
Conwest Exploration	-59.93	+103.21
Teck Corp.	-48.53	+7.26
Wright-Hargreaves Mines	-48.05	-3.45
Upper Canada Mines	-45.54	-54.44
Cassiar Asbestos Corp.	-37.96	+21.53
Sherritt Gordon Mines	-33.73	+68.18
Hallnor Mines	-30.02	+15.38
Sigma Mines	-24.21	-20.24
Kerr-Addison Mines	-23.77	-1.66
Campbell Chibougamau Mines	-23.25	+13.69
United Keno Hill Mines	-21.88	-12.35
Lake Shore Mines	-19.98	-18.60
Giant Yellowknife Mines	-17.29	-21.36
Little Long Lac Mines	-13.33	-2.50
Hudson Bay Mining & Smelting	-12.77	-3.94
Labrador Mining & Exploration	-10.03	-19.57
Discovery Mines	-10.00	-2.41
Hollinger Remove Gold Mines	-9.92	-3.60
Steep Rock Iron Mines	-9.85	-0.17
East Malartic Mines	-7.38	-21.52
Aunor Gold Mines	-7.13	-16.81
Reeves Macdonald Mines	-6.82	+84.68
New Calumet Mines	-5.72	+11.43
Asbestos Corp.	+2.71	+3.32
Dickenson Mines	+2.80	+0.89
Madsen Red Lake Mines	+4.06	-10.44
Willroy Mines	+6.01	-4.29
Bralorne Can-Fer Mines	+9.70	-17.36
Gunnar Mining	+10.70	+0.68
International Nickel	+17.52	+9.05
Cochénour-Willans Gold Mines	+35.06	-5.62



EXPECTED AND ACTUAL CHANGES IN VALUE OF \$100 WORTH OF EACH  
STOCK HELD FROM JUNE 18, 1971 TO AUGUST 4, 1971.

Stock	Changes in Value ( $\Delta V$ )	
	Expected	Actual
Yellowknife Bear Mines	-206.92	-39.36
Manitou-Barvue Mines	-159.26	-44.44
Denison Mines	-158.65	-1.89
Siscoe Mines	-127.73	+195.52
Pamour Porcupine Mines	-104.05	+3.23
Dome Mines	-92.35	+53.67
Agnico Mines	-84.62	+40.39
Yukon Consolidated Gold Corp.	-74.58	-16.95
Campbell Red Lake Mines	-74.27	+40.01
Preston Mines	-70.58	-12.39
Falconbridge Nickel Mines	-64.22	-74.29
Conwest Exploration	-56.34	-39.20
McIntyre Porcupine Mines	-50.59	-107.33
Wright-Hargreaves Mines	-48.05	+15.86
Upper Canada Mines	-39.62	+13.33
Teck Corp.	-35.01	-25.70
Cassiar Asbestos Corp.	-31.34	+4.89
Sherritt Gordon Mines	-29.62	-49.78
Hallnor Mines	-23.97	-2.56
Campbell Chibougamau Mines	-23.25	+6.12
Kerr-Addison Mines	-22.72	-0.28
Lake Shore Mines	-19.98	+0.66
Sigma Mines	-19.68	+11.91
United Keno Hill Mines	-19.62	+16.54
Little Long Lac Mines	-13.33	0
Hudson Bay Mining & Smelting	-11.23	+1.60
Hollinger Remove Gold Mines	-9.22	+6.93
Discovery Mines	-8.53	-7.82
East Malartic Mines	-7.38	0
Giant Yellowknife Mines	-7.29	+20.51
Steep Rock Iron Mines	-7.06	-2.17
Labrador Mining & Exploration	-6.57	-4.82
New Calumet Mines	-5.72	-2.86
Reeves Macdonald Mines	-4.93	-13.71
Aunor Gold Mines	-1.30	+1.68
Asbestos Corp.	+1.17	+6.51
Madsen Red Lake Mines	+6.18	-2.17
Dickenson Mines	+10.18	+8.41
Willroy Mines	+10.37	-6.14
Gunnar Mining	+12.49	+0.06
Bralorne Can-Fer Mines	+12.82	+2.48
International Nickel	+14.60	-57.50
Cochénour Willans Gold Mines	+37.05	-1.87



EXPECTED AND ACTUAL CHANGES IN VALUE OF \$100 WORTH OF EACH  
STOCK HELD FROM DECEMBER 22, 1971 TO JANUARY 31, 1972.

Stock	Changes in Value ( $\Delta V$ )	
	Expected	Actual
Yellowknife Bear Mines	-206.92	+21.28
Manitou-Barvue Mines	-159.26	+88.89
Denison Mines	-158.65	+43.41
Siscoe Mines	-127.73	-79.10
Pamour Porcupine Mines	-104.05	+88.71
Dome Mines	-92.35	+64.45
Agnico Mines	-84.62	+32.69
Yukon Consolidated Gold Corp.	-74.58	+67.80
Campbell Red Lake Mines	-74.27	+74.30
Preston Mines	-70.58	+31.86
Falconbridge Nickel Mines	-64.22	+23.46
Conwest Exploration	-56.34	+20.00
McIntyre Porcupine Mines	-50.59	-0.93
Wright-Hargreaves Mines	-48.05	+13.79
Upper Canada Mines	-39.62	+28.89
Teck Corp.	-35.01	+27.94
Cassiar Asbestos Corp.	-31.34	+14.80
Sherritt Gordon Mines	-29.62	-14.32
Hallnor Mines	-23.97	+15.38
Campbell Chibougamau Mines	-23.25	+18.93
Kerr-Addison Mines	-22.72	+5.88
Lake Shore Mines	-19.98	+12.03
Sigma Mines	-19.68	+23.81
United Keno Hill Mines	-19.62	+11.11
Little Long Lac Mines	-13.33	+15.00
Hudson Bay Mining & Smelting	-11.23	+0.26
Hollinger Remove Gold Mines	-9.22	+9.58
Discovery Mines	-8.53	-1.20
East Malartic Mines	-7.38	+31.65
Giant Yellowknife Mines	-7.29	+20.51
Steep Rock Iron Mines	-7.06	+2.34
Labrador Mining & Exploration	-6.57	+21.11
New Calumet Mines	-5.72	+14.29
Reeves Macdonald Mines	-4.93	+8.07
Aunor Gold Mines	-1.30	+16.81
Asbestos Corp.	+1.17	+9.30
Madsen Red Lake Mines	+6.18	+8.70
Dickenson Mines	+10.18	+19.91
Willroy Mines	+10.37	+11.04
Gunnar Mining	+12.49	+0.92
Bralorne Can-Fer Mines	+12.82	+8.27
International Nickel	+14.60	-1.30
Cochénour Willans Gold Mines	+37.05	+5.62





stock would be the change in value experience by an investor who held \$100 worth Aunor Gold, or 42.02 shares (see discussion above), in 1958. In computing the predicted change in values, the first model (White Paper model) was employed for the first test period. Since the provisions of the Reform Bill and the subsequent legislation are for purposes of our analysis identical, the second model (Reform Bill model) was employed for the second and third test periods. Hence the predicted changes in value are identical for these two test periods. The actual computation of predicted change in value will be illustrated by applying both models in the prediction of the expected change in values for the investor who held 42.02 shares of Aunor Gold in 1958. Since we have used simple arithmetic means in predicting yearly capital gains (C) and yearly dividends (D) the expected change in the investor's tax position as a result of proposed (or actual) tax changes will be constant from year to year. We are interested in arriving at the present value of the expected future tax change discounted at the opportunity rate of return. Since we are assuming this tax change to be infinite and constant from year to year, we may represent the expected change in value ( $\Delta V$ ) as the expected annual tax change ( $\Delta T$ ) divided by the opportunity rate of return ( $i$ ) or  $\Delta V = \frac{\Delta T}{i}$ .<sup>8</sup>

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<sup>8</sup>The sum of a geometric progression to infinity is the constant term divided by the appropriate discount factor.



For Aunor Gold then we can compute the expected change in value for test period one by applying the White Paper model as follows:

$$V = \frac{(D-YD)(R-X) - [R(D+Z+.5C-Z)]}{i}$$

where  $R=0.5$ ,  $i=0.15$ ,  $X=0.2$  and where the remaining variable values are obtained from Appendix A.

$$V = \frac{[8.40 - (0.15 \times 8.40)](0.5 - 0.2) - [0.5[8.40 + 1.05 + 0.5(-1.850)] - 1.05]}{0.15}$$

$$= -7.13$$

Thus for the investor who held 42.02 shares of Aunor Gold (\$100 worth in 1958) we would predict a decline in value of \$7.13 (see Table 4-2) for his holdings immediately following the announcement of the White Paper. Turning now to test periods two and three we will apply the Reform Bill model to compute the expected change in value for Aunor Gold as follows:

$$V = \frac{(D-YD)(R-X) - [R(D+D/3+.5C) - (D \div 3)]}{i}$$

where  $R=0.5$ ,  $i=0.15$ ,  $X=0.2$  and where the remaining variable values are obtained from Appendix A.

$$V = \frac{[8.40 - (0.15 \times 8.40)](0.5 - 0.2) - 0.5[8.40 + (8.40 \div 3) + (0.5)(1.85)] - \dots}{0.15}$$

$$(8.50 \div 3) = -1.30$$

Thus for the investor who held \$100 worth of Aunor Gold (42.02 shares) in 1958 we would predict a decline in value of \$1.30 (see Tables 4-3 and 4-4) for test periods two and three respectively. Since the model employed in predicting changes



in value is the same for both of these test periods (see above discussion) the values in the predicted change in value columns of Table 4-3 and Table 4-4 are identical. A procedure similar to the one used to compute the predicted value of Aunor Gold was used to arrive at the predicted change in value for the remaining stocks for each of the three test periods.

The stocks in Tables 4-2, 4-3 and 4-4 are arranged in order of the expected decrease in value with the ones showing the greatest expected decline in value (expected tax increase) appearing first. With the exception of eight stocks in the first test period and seven stocks in the second and third test periods the expected changes in value are negative. This reflects the fact that most of the stocks receive harsher treatment under both the White Paper system and the provisions of the Reform Bill than under the former system caused mainly by the inclusion of capital gains into taxable income. For test period one, Table 4-2 shows predicted increases in value for the shares of Asbestos Corp., Bralorne Can-Fer, Cochenour Willans, Dickenson, Gunnar, International Nickel, Madsen Red Lake, and Willroy. For test periods two and three Tables 4-3 and 4-4 respectively, indicate expected increases in value for the shares of Bralorne Can-Fer, Cochenour Willans, Dickenson, Gunnar, International Nickel, Madsen Red Lake, and Willroy. Appendix A reveals that for all of the stocks that had expected future



increases in values we had predicted significant capital losses (negative value of C). Since capital losses become deductible for the first time under the White Paper provisions and the Reform Bill provisions, the value of these stocks might be expected to increase rather than decrease, although the assumption of an infinite series of such losses could be called into question.

The figures in the actual change in value columns of Tables 4-2, 4-3 and 4-4 reflect the change in value that an investor would experience by holding \$100 worth (in terms of 1958 prices) of a stock for the duration of each of the three test periods. For example, Aunor Gold traded at a November 7 high-low of 2.90 and 2.81 for a high-low average of 2.85 ( $[2.90+2.80] \div 2$ ) and a December 31 high-low of 2.46 and 2.44 for a high-low average of 2.45 ( $[2.46+2.44] \div 2$ ). Thus a share of Aunor Gold fell by \$.40 (2.45-2.85) during the first test period. The actual change in value for this investor's holdings of Aunor Gold for the first test period is the change in value of 42.02 shares (\$100 worth in 1958) of Aunor stock held from November 7, 1969 to December 31, 1969. Table 4-2 indicates that this actual change in value is a decline of \$16.81. The expected changes in value for the stocks for all three test periods were calculated in a similar manner.





### Tests On The Results

In order to test the theory of tax capitalization the expected or hypothetical stock price changes were compared to the actually observed price changes that took place during the three test periods November 7, 1969 to December 31, 1969; June 18, 1971 to August 4, 1971; and December 22, 1971 to January 31, 1972. These three periods were chosen as the most likely points in time during which tax capitalization would be expected to occur. Tax capitalization can occur at several points in time but it seems most realistic to begin an analysis of this phenomenon from a point in time when the taxpayer can actually compute the precise amount of the changes in his future income stream which will come about as a result of proposed tax changes. Although certain changes in tax legislation may have been foreseen as far back as the press releases of the Royal Commission on Taxation it was not until the White Paper was made public on November 7, 1969 that the actual amount of the tax changes could be computed. Furthermore, it would be extremely difficult to test for tax capitalization during the lengthy period between the Carter enquiry and the White Paper. It seems reasonable to suggest that investors might have expected the draft legislation coming out of the White Paper to be somewhat less harsh than the White Paper proposals. In that case we would not expect tax capitalization to occur until the legislation was introduced into Parliament. For this

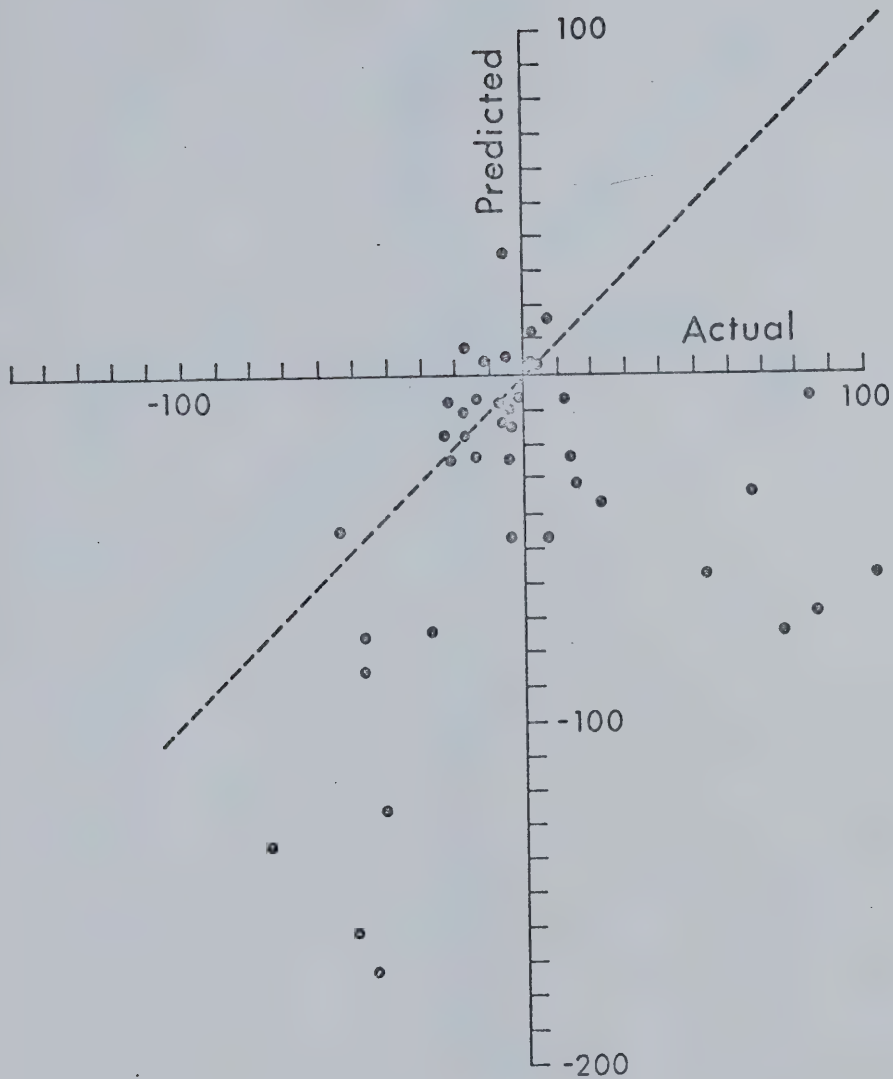


reason a second test period was used to test for tax capitalization following the introduction of the Tax Reform Bill into the House of Commons on June 18, 1971. It is also possible that investors might wait until final legislation is enacted before making asset price adjustments. To test for this possibility a third and final test period was used to test for tax capitalization following the enactment of the new Income Tax Act on January 1, 1972. The test periods were kept relatively short in order to reduce the likelihood of other variables affecting stock prices.

According to our model the predicted stock price changes should exactly correspond to the observed price changes. Although such rigid requirements would be unrealistic, the theory of tax capitalization would at least be supported if the largest tax increases were found to correspond to the largest decrease in actual value and the largest tax decreases were found to correspond to the largest actual increases in value. Thus in Figures 4-1, 4-2 and 4-3 for perfect correlation we would expect all plotted stocks to lie on the 45 degree line passing through the origin and lying in the first and third quadrants. The theory would at least be supported if the plotted stocks were found to cluster around such a line in the first and third quadrants. A cursory look at the results plotted for the three test periods reveals no such apparent concentration of points in Figures 4-1, 4-2 and 4-3.

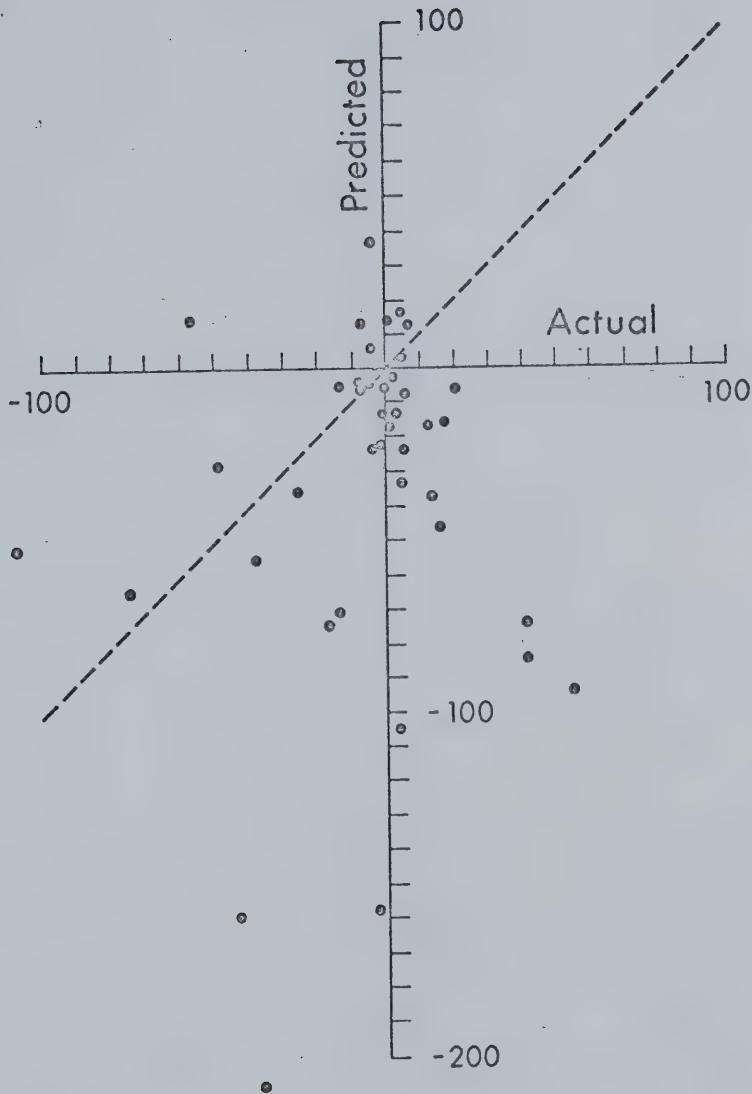
The chi-square test for goodness of fit was applied





PREDICTED CHANGE IN VALUE PLOTTED AGAINST ACTUAL CHANGE IN  
VALUE FOR EACH OF THE STOCKS FOR THE PERIOD  
November 7, 1969 To December 31, 1969.

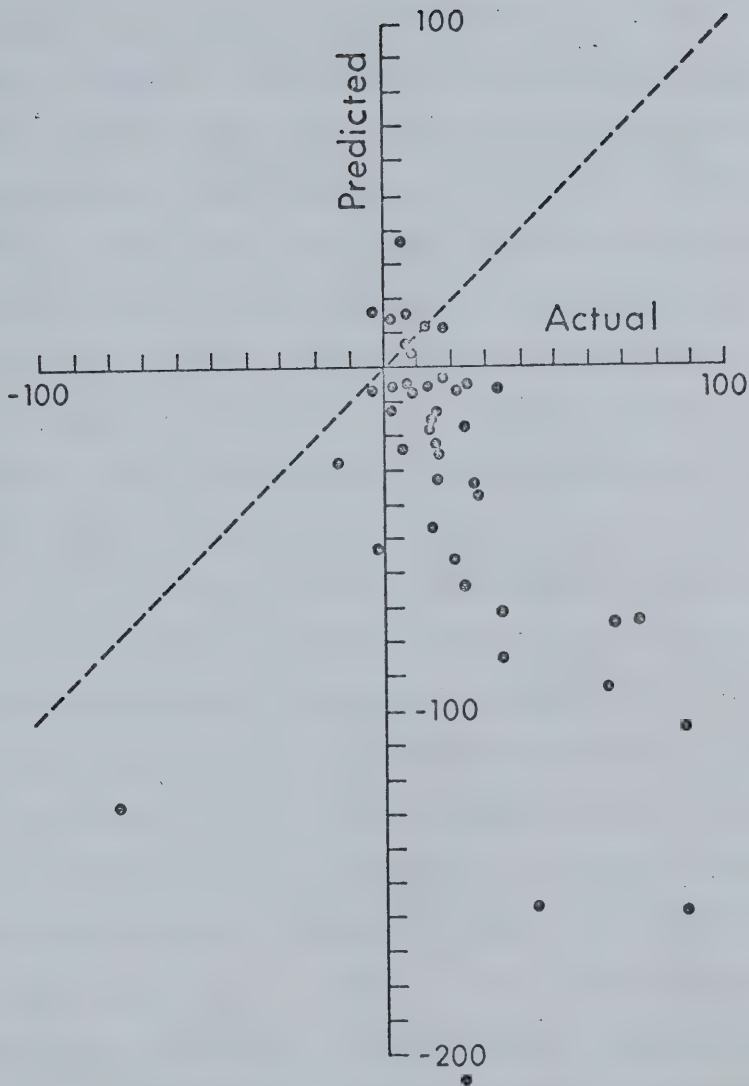




PREDICTED CHANGE IN VALUE PLOTTED AGAINST ACTUAL CHANGE IN  
VALUE FOR EACH OF THE STOCKS FOR THE PERIOD  
June 18, 1971 To August 4, 1971.







PREDICTED CHANGE IN VALUE PLOTTED AGAINST ACTUAL CHANGE IN  
VALUE FOR EACH OF THE STOCKS FOR THE PERIOD  
December 22, 1971 To January 31, 1972.



to test for the significance of the relationship between predicted and actual changes in value for each of the three test periods. Extremely high chi-square values confirmed that even at the .001 level of significance there was no significant relationship between predicted and actual values. We are thus led to conclude that there is no evidence to support the theory of tax capitalization in the share prices of mining stocks. Explanation for this turns around the possibilities that all of the conditions outlined by Buehler, which must be met before tax capitalization can be expected to occur, may not have been fully satisfied.

To begin with, as the name implies, the White Paper was a set of proposals for tax reform. Furthermore, former Finance Minister Benson had publicly made it quite clear that these were only proposals and should not be taken as final legislation. He in fact indicated that he welcomed debate and submissions on the specific proposals before they would be implemented. Mining and petroleum interests made many submissions to Mr. Benson. It is quite conceivable, then that the investment community anticipated less severe tax treatment than that proposed in the White Paper. Thus Buehler's fourth condition may not have been met at the time of the White Paper. Investors may not have known with sufficient certainty just what the final tax effect would be. If they were in fact awaiting the bill or enactment of final legislation we would not expect tax capitalization to occur



at this time.

Secondly, the tax changes proposed in both the White Paper and the Reform Bill affect in the main, only Canadian investors. In 1963, 62 per cent of the mining and extractive industry was owned or controlled by non-residents and 54 per cent by U. S. residents.<sup>9</sup> Given this high degree of U. S. investment in the resource industry we might expect investors to react only mildly to the proposals. For one thing, U. S. residents have for some time already been subject to a capital gains tax<sup>10</sup> and would not benefit from the dividend tax credit, nor would they benefit from the gross-up provisions. Although it was proposed to tax the stock gains of non-residents, this would only apply to non-residents who own more than 25 per cent of the stock of a Canadian company.<sup>11</sup> Furthermore, under the White Paper this provision was not to go into effect until 1974.<sup>12</sup> International tax agreements, such as the one Canada has with the U. S. would prevent the Canadian government

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<sup>9</sup>Canada, Report of the Task Force on the Structure of Canadian Industry, (Ottawa: Queen's Printer, 1968), Table, p. 422.

<sup>10</sup>United States, Internal Revenue Code of 1954, Statutes At Large, LXIII A, s, 1201 (1954).

<sup>11</sup>Canada, Proposals For Tax Reform, Par. 6.47.

<sup>12</sup>Ibid, par. 6.47.



from taxing the capital gains of foreign investors.<sup>13</sup> The government has placed a target date of 1976<sup>14</sup> for the renegotiation of existing tax treaties so it appears that 1976 is the earliest date that the capital gains provision of the new Income Tax Act would be applicable to non-resident shareholders of public Canadian companies. Thus Buehler's third condition may not have been entirely satisfied. That is, investors did not perceive any differential tax treatment to capitalize.

Another possible reason for the absence of tax capitalization after the Tax Reform Bill and the subsequent legislation could be explained by reference to the capital gains tax provisions. Perhaps investors had expected capital gains to be fully taxable and when only one-half capital gains became taxable under the new Act stock prices would rise rather than fall. Here again investors may not have perceived a tax inequality to capitalize. Appendix A shows that the estimated capital gains (C) for most stocks are somewhat higher than the estimated dividends (D). It is reasonable therefore to suggest that perhaps capital gains considerations figure rather more strongly in the investor's

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<sup>13</sup>Canada-United States International Tax Agreement S.VIII, reprinted in Canada Income Tax Guide, (Ottawa: Commerce Clearing House, 1969), p. 5503.

<sup>14</sup>CCH editors, Analysis of the Canadian Tax Reform Bill 1971, CCH Canadian Limited p. 53.





decisions than do dividends.

It also seems logical that due to the lengthy process of tax reform as experienced in Canada, investors gradually made asset price adjustments over a long period--adjustments than would be less dramatic than our theory would predict. Such gradual price adjustments would not show up in our brief test periods since they would have occurred prior to our first test period. It should be borne in mind that it took almost ten years from the time the Carter Commission was appointed in 1962 to look into tax reform until the Income Tax Act was finally amended to incorporate some of these reforms.

Finally, it could be that investors simply are not aware of the impact of the tax changes upon their returns from mining stocks. Perhaps they will not become fully aware of the full impact of these changes until they file their 1972 tax returns early in 1973. If this is the case Buehler's fourth condition of certainty of tax change will not be met until that time. Smith<sup>15</sup> in his study of property tax capitalization found that a great proportion of capitalization occurred after the new assessment of property taxes. This assessment could be considered similar in effect to the "assessment" the shareholder of mining stocks would experience

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<sup>15</sup>R. Stafford Smith, "Property Tax Capitalization in San Francisco," National Tax Journal, Vol. 23, 1970, pp. 187.



at the time he files his return. Any or all of the above suggestions may explain why tax capitalization was not observed.

The final chapter will constitute a summary of this study and the conclusions drawn from the empirical testing.



## CHAPTER V

## SUMMARY AND CONCLUSION

Summary

Analysis of the tax changes contained in the White Paper and the Tax Reform Bill has shown that shareholders of some mining stocks will lose tax advantages enjoyed under the former tax system. This is brought about mainly by the taxation of capital gains, removal of the shareholder depletion allowance and the removal of the dividend tax credit. The holders of mining stocks with a high capital gains component in their return would suffer more relative to the holders of stock with a high dividend component in their return. Also those shareholders who formerly could claim shareholder depletion would suffer more than those who had no depletion allowance to lose.

The theory of tax capitalization suggests that if the rate of return is to remain unchanged, the expected future tax burden will be capitalized, i.e. reflected in a decline in current share prices. To test this theory two models were developed to provide predictions of changes in value attributable to the tax changes. A selected sample of forty-three mining stocks was used. These expected or predicted changes in value were then compared to the actual changes in value that occurred in each stock following first



the announcement of the White Paper, secondly the introduction of the Tax Reform Bill into Parliament, and thirdly the enactment of the new Income Tax Act.

### Conclusion

This study was undertaken primarily in response to the findings of the Cummins study cited earlier. The results of that study provide no evidence to support the theory of tax capitalization. Although several empirical studies have been made testing for tax capitalization in property values<sup>1</sup> the Cummins study appears to be the first attempt at empirically testing the theory with respect to share prices.

This study tests for tax capitalization in the share prices of a selected sample of mining stocks during three test periods. In each period no evidence was found to support the theory of tax capitalization.

This lack of any observable tax capitalization may be due to several reasons. First of all, following the announcement of the White Paper, investors may have anticipated less harsh treatment in the final legislation and hence would not make any price adjustments at this time. Secondly, the tax proposals of both the White Paper and the Reform Bill do not affect significantly non-resident share-

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<sup>1</sup>For example, see R. S. Smith, "Property Tax Capitalization in San Francisco," National Tax Journal, Vol. 23, 1970, pp. 177-191.





holders. This fact coupled with the high degree of non-resident ownership of the mining industry could explain the absence of observable tax capitalization. Thirdly under the provisions of the Reform Bill and the subsequent Income Tax Act only one-half of capital gains are taxable whereas the White Paper had proposed full taxation of such gains. This could have had the effect of causing share prices to rise following the Tax Reform Bill as investors may have perceived this as a reduction from the taxes expected under the White Paper. Fourthly, because of the lengthy process of tax reform in Canada, investors may have made gradual asset price adjustments over a long period of time. Finally, investors may not be fully aware of the effect the proposals will have on their returns until they file their first tax return under the new system.

In conclusion, this study of income tax capitalization in the share prices of a selected sample of mining stocks lends no support to the theory to tax capitalization.



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PREDICTED VALUES OF YEARLY CAPITAL GAINS (C), YEARLY PRE-TAX EARNINGS (E1), YEARLY AFTER TAX EARNINGS (E), YEARLY DIVIDENDS (D), YEARLY GROSS-UP (Z), AND YEARLY SHAREHOLDER DEPLETION ALLOWANCE (Y) FOR EACH STOCK

Stock	C	E1	E	D	Z	Y
Agnico Mines	50.77	6.58	6.58	0	0	0
Asbestos Corp.	-1.86	7.83	4.85	3.10	1.50	0.20
Aunor Gold Mines	-1.85	11.60	9.49	8.40	1.05	0.15
Bralorne Can-Fer Mines	-8.07	3.17	3.17	2.81	0	0
Campbell Chibougamau Mines	13.95	7.98	7.98	0	0	0
Campbell Red Lake Mines	42.43	11.06	7.45	5.72	1.81	0.20
Cassiar Asbestos Corp.	13.87	15.40	10.57	13.21	2.42	0.20
Cochenour Willans Gold Mines	-22.47	-1.57	-1.57	1.80	0.003	0
Conwest Exploration	32.80	10.60	10.62	3.20	0.01	0.15
Denison Mines	91.35	16.75	16.75	10.27	0	0.20
Dickenson Mines	-8.59	9.29	9.29	6.64	0	0.20
Discovery Mines	4.94	2.89	2.89	1.33	0	0
Dome Mines	53.29	16.80	10.84	5.69	2.84	0.20
East Malartic Mines	4.43	4.91	4.91	0	0	0
Falconbridge Nickel	33.63	26.18	20.64	13.14	2.77	0.20
Giant Yellowknife Mines	0.03	12.85	11.11	11.62	0.87	0.20
Gunnar Mining	-7.72	-6.35	-6.42	1.72	0.04	0
Hallnor Mines	10.97	14.87	12.41	9.13	1.23	0.20
Hollinger Remove Gold Mines	4.26	10.53	8.24	4.06	1.14	0.15
Hudson Bay Mining & Smelting	3.92	16.27	12.15	7.57	2.06	0.20
International Nickel	-11.52	18.18	11.50	7.39	3.34	0.20
Kerr-Addison Mines	12.75	3.69	2.73	2.37	0.48	0.20
Labrador Mining & Exploration	1.21	13.70	10.89	7.33	1.40	0.20
Lake Shore Mines	11.99	8.31	8.31	0	0	0
Little Long Lac Gold Mines	8.00	3.40	3.40	0	0	0
Madsen Red Lake Gold Mines	-4.09	6.09	5.48	2.83	0.31	0
Manitou-Barvue Mines	95.55	73.33	73.33	0	0	0
McIntyre Porcupine Mines	27.02	11.87	11.53	8.93	0.17	0.20
New Calumet Mines	3.43	2.46	2.46	0	0	0
Pamour Porcupine Mines	55.81	21.19	21.19	17.74	0	0.20



Stock	C	E1	E	D	Z	Y
Preston Mines	40.29	5.34	5.34	4.43	0	0.20
Reeves Macdonald Mines	0.81	25.16	15.55	16.13	4.81	0
Sherritt Gordon Mines	17.14	10.97	10.26	4.78	0.36	0
Sigma Mines (Quebec)	9.14	11.62	9.57	7.14	1.02	0.20
Siscoe Mines	72.24	29.26	24.78	11.79	2.24	0.20
Steep Rock Iron Mines	3.30	4.43	4.43	2.51	0	0.20
Teck Corp.	14.75	26.14	23.07	17.76	1.53	0.20
United Keno Hill Mines	11.26	11.66	10.44	3.85	0.61	0
Upper Canada Mines	21.78	8.67	8.67	5.33	0	0.20
Willroy Mines	-6.75	9.33	9.33	3.93	0	0
Wright-Hargreaves Mines	28.83	3.31	3.31	0	0	0
Yellowknife Bear Mines	121.49	4.73	4.73	8.51	0	0.15
Yukon Consolidated Gold Corp.	44.75	1.90	1.90	0	0	0



## APPENDIX B

PROCEDURES EMPLOYED IN THE PREDICTION OF CAPITAL  
GAINS (C), PRE-TAX EARNINGS (E1),  
AFTER-TAX EARNINGS (E) AND DIVIDENDS (D)

Historical data on capital gains (C), pre-tax earnings per share (E1), after-tax earnings per share (E) and dividends per share (D) for each stock for the eleven year period 1958 to 1968 were plotted on scatter diagrams. These diagrams revealed that for most of the stocks linear regression equations employing eleven years data would be a poor predictor of earnings and dividends since the plotted points appeared to follow no particular trend. Thus the following regression equations used in the Cummins study were not used as predictors of dividends (D), after-tax earnings (E) and pre-tax earnings (E1).

- (a)  $D = a + aT$
- (b)  $E = b + bT$
- (c)  $E1 = c + cT$

Instead simple arithmetic means of each of these variables for the five year period 1964 to 1968 were employed as the predictors of the future values of dividends (D), after-tax earnings (E) and pre-tax earnings (E1). It was felt that investors when making predictions about the future behavior of earnings and dividends might well use an arithmetic average from recent years, say the last five years, as a guide.

For capital gains (C) it was decided to employ the method of ordinary least squares in the following regression





## APPENDIX B--Continued

equation to arrive at a predicted value of (C):

$$C = d + d_1 E + d_2 D.$$

A linear regression equation was used because it was felt that the capital gains of a stock were dependent upon the earnings and dividend that the stock yielded and that the same weight should not be given to far removed observations as to more recent ones as is the case in the simple averaging procedure employed in the prediction of (D), (E) and (E1). In those cases where a stock paid no dividends the following regression equation was employed:

$$C = d + d_1 E.$$

For both of these regression equations, time series data for the five years 1964 to 1968 were used. Data farther back than this appeared to lose much of its predictive value. The values of the constant,  $d$  and the regression coefficients  $d_1$  and  $d_2$  as well as the  $t$ -values for these coefficients are contained in Appendix C. The  $t$ -test for the significance of the coefficients showed that at the .05 level of significance only four of the forty-three stocks had regression coefficients significantly different from zero. For this reason it was decided to employ a simple arithmetic average of the last five years, 1964 to 1968 as the appropriate predictor of capital gains (C) as well.



REGRESSION COEFFICIENTS AND T-VALUES OF THE REGRESSION  
COEFFICIENTS IN THE EQUATION

$$C = d + d_1 D + d_2 D$$

EMPLOYED IN THE PREDICTION OF CAPITAL GAINS (C)\*

Stock	d	d <sub>1</sub>	d <sub>2</sub>	T-Value d <sub>1</sub>	T-Value d <sub>2</sub>
Agnico Mines	24.32	0.09	-	0.065	-
Asbestos Corp.	-29.71	4.71	0.75	0.994	0.108
Aunor Gold Mines	15.29	2.57	-4.47	0.293	-0.222
Bralorne Can-Fer Mines	14.33	-0.19	2.00	-0.070	0.580
Campbell Chibougamou Mines	10.73	-1.53	-	-0.473	-
Campbell Red Lake Mines	51.40	31.96	-43.51	1.870	-1.019
Cassiar Asbestos Corp.	43.04	4.17	-5.68	0.955	-1.984
Cochenour Willans Gold Mines	-52.55	-2.67	15.82	-0.534	1.185
Conwest Exploration	22.54	-0.80	-	0.394	-
Denison Mines	-75.98	0.76	12.99	0.168	1.800
Dickenson Mines	10.22	-2.37	2.96	-0.446	0.753
Discovery Mines	14.27	-11.17	10.12	-1.883	1.461
Dome Mines	59.66	17.26	-34.17	5.646	-2.849
East Malartic Mines	17.15	-2.43	-	0.662	-
Falconbridge Nickel	20.04	1.80	-2.13	0.280	-0.268
Giant Yellowknife Mines	-4.91	8.53	-7.46	1.152	-0.999
Gunnar Mining	0.99	0.63	-2.40	1.253	-1.597
Hallnor Mines	-41.52	-1.13	7.29	-0.318	1.304
Hollinger Remove Gold Mines	-17.73	0.51	4.90	0.080	0.296
Hudson Bay Mining & Smelting	23.28	1.39	-5.07	0.202	-0.239
International Nickel	59.64	9.18	-24.57	0.259	-0.516
Kerr-Addison Mines	20.48	-5.00	-0.42	-0.756	-0.054
Labrador Mining & Exploration	9.82	-2.49	3.09	-0.350	0.333
Lake Shore Mines	-6.93	1.34	-	1.756	-
Little Long Lac Gold Mines	5.80	-1.25	-	-0.600	-
Madsen Red Lake Gold Mines	1.54	-3.75	4.56	-1.280	1.656
Manitou-Barvue Mines	-9.30	0.88	-	0.600	-
McIntyre Porcupine Mines	1.76	19.39	-22.44	3.018	-2.717
New Calumet Mines	-2.60	1.04	-	0.155	-



Stock	d	d <sub>1</sub>	d <sub>2</sub>	T-Value	T-Value
				d <sub>1</sub>	d <sub>2</sub>
Pamour Porcupine Mines	-18.05	0.95	2.66	0.202	0.078
Preston Mines	29.02	5.89	-6.43	0.647	-0.632
Reeves McDonald Mines	3.51	1.31	-0.84	0.612	-0.311
Sherritt Gordon Mines	-61.09	6.66	2.82	2.280	0.629
Sigma Mines (Quebec)	-11.56	0.55	2.08	0.131	0.277
Siscoe Mines	94.29	5.85	-14.82	1.193	-0.908
Steep Rock Iron Mines	-50.04	6.33	9.09	3.144	2.954
Teck Corp.	16.74	8.72	-12.13	1.811	-1.829
United Keno Hill Mines	13.04	-1.08	1.65	-0.271	-0.309
Upper Canada Mines	12.58	-13.82	21.92	-1.613	1.152
Willroy Mines	-5.64	0.13	0.21	0.167	0.069
Wright-Hargreaves Mines	47.08	-7.85	-	-4.515	-
Yellowknife Bear Mines	17.28	-18.20	20.41	-0.871	1.192
Yukon Consolidated Gold Corp.	44.95	-10.07	-	-1.943	-

\* For those stocks that had zero dividends the regression equation  $C = d + d_1 E$  was employed.











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